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An Evaluation of the Dangerous Choices I program for female high school students

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AN EVALUATION OF THE *DANGEROUS CHOICES I* PROGRAM FOR FEMALE HIGH SCHOOL STUDENTS

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By

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ABSTRACT

AN EVALUATION OF THE *DANGEROUS CHOICES I* PROGRAM

FOR FEMALE HIGH SCHOOL STUDENTS

By

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May 2011

Thesis supervised by Dr. Joseph Yenerall and Dr. Moni McIntyre

The purpose of this study was to evaluate the impact of the *Dangerous Choices I* program on increasing knowledge about teen dating violence for secondary school students. The sample size for this study comprised of seventy-one ninth grade female students from two different urban school districts who participated in the program during spring, 2010. Pretest and posttest design was employed to determine the statistically significant differences among different groups. Each item of the questionnaire was analyzed to learn the level of awareness of participants about the nature of dating violence before participation in the program and if positive changes occurred following the program. The results of the study revealed statistically significant changes after participation in the program. The main conclusion was that the *Dangerous Choices I* program is effective in increasing the knowledge of participants and important for public schools in prevention of teen dating violence.

DEDICATION

In memory of my younger brother and younger sister

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LIST OF ABBREVIATIONS

CDC – Centers for Disease Control and Prevention

DCI – Dangerous Choices I program

NRCDV – National Resource Center on Domestic Violence

PCADV – Pennsylvania Coalition against Domestic Violence

PFA – Protection from Abuse

WC&S – Women's Center and Shelter

YRBSS – Youth Risk Behavior Survey Surveillance

I. Introduction

Until recently, little attention has been devoted to teen dating violence. Nevertheless, the problem has been drawing attention the past few years and has been discussed among policy-makers, practitioners, and scholars. The dating period mostly starts in middle school and approximately seventy-five percent of eighth and ninth graders are in dating relationships (Averly-Leaf & Cascardi, 2002; Foshee et al., 1996). In the study by Permanente, about eighty-nine percent of teenagers between the ages of 13 and 18 have been in dating relationships (as cited by National Resource Center on Domestic Violence, 2004). According to the 2007 Youth Risk Behavior Survey Surveillance (YRBSS) only seven percent of high school students reported that they had a sexual experience for the first time before age thirteen; by ninth grade forty-eight percent of students already had a sexual experience (CDC, 2008). Thus, many students start dating relationships and sexual activity in middle school.

Teen dating violence causes a wide range of negative effects on students that seriously impact their health and academic attainments in schools. Many recent studies report that students who experience physical or sexual violence have difficulty with school subjects (Levy, 2006). There are several causes of teen dating violence but the major cause is a lack of knowledge about teen dating violence, as noted by teen dating experts. The teenagers do not know how to recognize warning signs of abuse, risk factors, and precursors of teen dating violence (Sugarman & Hotaling, 1989).

Different statistical evidence reveals that female students are especially vulnerable and experience all types of abuse in dating relationships. Various studies

indicate that “females are two to three times more likely than males to perceive themselves as victims in the violent episodes” (Sugarman & Hotaling, 1989, p.12).

In addressing teen dating violence, a variety of school-based prevention programs have been launched and implemented across the states. The main objective of all dating violence prevention programs is to increase students’ knowledge, raise their awareness of teen dating violence, and equip them with skills for developing healthy relationships.

In recent years, many researchers have been interested in the effectiveness of dating violence prevention programs and have evaluated them for changes in knowledge and attitudes of participants, but still the results of those studies differ from each other in their goals, subjects, and statistical procedures. Likewise, there is scarce information concerning studies evaluating the content of dating violence prevention programs because the curricula of most of these programs have different goals and objectives and variations in length and methods. However, nearly all dating violence prevention programs have some common components in their content such as the definition of an abusive relationship, warning signs of abuse, the role of bystanders, and safety plan tools. One such program is the *Dangerous Choices I* program offered in the secondary schools of Pittsburgh by the Women’s Center and Shelter of Greater Pittsburgh.

The *Dangerous Choices I* program

The Women's Center & Shelter of Greater Pittsburgh (WC&S) was founded in 1974 and was one of the first six shelters in the United States for battered women. Since that time, WC&S has been implementing programs aimed at preventing domestic violence and providing services to victims of domestic violence.

In 1987, the WC&S developed a primary prevention program named *Dangerous Choices I* for Pittsburgh Public Schools with the aim of preventing teen dating violence (WC&S, 2009). The curriculum was created by the Education Program staff of the WC&S. The primary goal of the *Dangerous Choices I* (DCI) program is to increase knowledge about the scope and nature of dating violence, address attitudes that may underlie violent behavior, increase knowledge of warning signs of potential abuse, and provide information regarding community resources. The *Dangerous Choices I* program targets the eighth and ninth grades in Pittsburgh Public Schools. It is conducted in the form of one 45-minute classroom presentation that takes place in a health class period. The program includes a didactic presentation of information, role-plays, exercises, and discussions to help participants acquire knowledge and skills to understand their own attitudes and behavior.

The definition of abuse is given as a main part of the program. Teenagers usually do not understand the term "abuse" or how to identify it in their interactions with peers. Other parts of the program include information regarding types of abuse. Then, students find out about stereotypes assigned to females and males according to role definitions. Much of the presentation teaches them to recognize abusive and controlling behaviors. Students discuss the reasons victims might stay in an abusive relationship and learn about current statistics regarding the issue. Discussions focus on dangerous characteristics, the cycle of violence, the warning signs of an abusive relationship, and legal and other options available for victims of dating violence. The Education Specialist provides students with information about safety planning and Protection From Abuse (PFA – a restriction order) orders (WCS, 2009). The most interesting part of the program relates to

role-playing when the Education Specialist makes up a story or case of abusing relationships. This kind of method helps students to perceive possible situations that may occur on a daily basis. Further, students are exposed to the scope of dating violence incidents and learn about available resources to consult if someone experiences violent behavior from a dating partner.

The WC&S provided presentations to nearly 4,839 students in Pittsburgh Public Schools from July 1, 2007 to June 30, 2008. Every year, the *Dangerous Choices I* program provides presentations to thirteen schools on average. The *Dangerous Choices I* program has been funded through the Pittsburgh Public Schools and other donor communities (WC&S, 2009).

The research hypothesis

This study evaluated the effectiveness of the *Dangerous Choices I* program offered in secondary schools and determined whether the program produced significant changes in the knowledge of participants towards dating violence. In addition, the purpose of the study was to analyze the questionnaire by looking at positive changes on each test item in order to elucidate which components of the program were most important or least comprehensible for increasing knowledge and changing attitudes of participants. This approach helped to reveal the participants' level of awareness of some important program components before and after participation in the program. Inspection of some aspects of the content allowed analyzing its comprehensiveness and significance.

Some recommendations on program improvement and directions for further research have been drawn from results of the study. This knowledge could be used for further designing and modification or for improving the prevention program.

The study tackled several research questions concerning possible statistically significant differences in total pretest and posttest scores before and after the program, including differences across race/ethnicity. The study also determined positive changes in each test item by analyzing frequencies of responses of participants from the pretest to the posttest.

The following hypotheses were tested in this study:

(H_o): There is no statistically significant difference in scores obtained from the pretest to the posttest by participants of the program.

(H_o): There is no statistically significant difference between the mean scores of two schools on the pretest and the posttest.

(H_o): There is no statistically significant difference between the mean scores of different groups by race/ethnicity on the pretest and the posttest.

(H_o): There is no statistically significant relationship between race/ethnicity and knowledge.

II. Literature Review

Definitions of teen dating violence

Many researchers offer varying definitions of dating violence, but they commonly describe it "as the use or threat of physical force or restrain carried out with the intent of causing pain or injury to another" within the dating relationship (Sugarman & Hotaling, 1989, p.5). A recent expanded definition, that includes other forms of abuse, is well-conceptualized and given by Weckerle and Wolfe; dating violence is to "…control or dominate another person physically, sexually, or psychologically, causing some level of harm" (as cited in Cornelius & Resseguie, 2007, p.365).

With respect to certain types of abuse, the Women's Center and Shelter of Greater Pittsburgh operationalized them as follows:

> Verbal Abuse: name-calling, put downs, yelling, use of profanity, unfounded accusations, cruel and hurtful remarks, degrading the victim in public, diminishing accomplishments, flying into rages.
> Physical Abuse: choking/strangulation, holding the victim down against their will, throwing or breaking objects, pushing, shoving, slapping, biting, punching, kicking, using a weapon, murder.
> Emotional Abuse: isolation, ignoring, controlling finances or employment, lack of trust, following or stalking the victim, criticizing, threats of suicide, threats of physical violence, threats of murder, behavior that minimizes or denies, explosive or critical reactions.
> Sexual Abuse: rape, forcing unwanted sexual acts, use of weapons during sex, forced sex involving multiple partners, inflicts pain during sex (WC&S, 2009).

Prevalence of teen dating violence

Teen dating violence predominantly begins in middle school. Many studies indicate that forty percent of dating violence incidents occur among teenagers between the ages of fourteen and fifteen (Rapp-Paglicci, Dulmus, & Wodarski, 2004; Rennison & Welchans, 2000). At this age, teenagers do not have enough knowledge about what a healthy relationship is and cannot recognize warning signs of abuse. Dating violence often starts with teasing and name calling and later turns into more serious forms of violence.

With respect to the prevalence of certain types of abuse, studies found that one of three teenagers experienced verbal, physical, emotional, or sexual abuse while being involved in a dating relationship (Avery-Leaf & Cascardi, 2002; Foshee et al., 1996; Levy, 2006). According to the Centers for Disease Control and Prevention (CDC), about ten percent or 1.5 million high school students nationwide experienced physical abuse from a dating partner (CDC, 2006). Surprisingly enough, incidents of verbal aggression happen more often than other types of abuse and they vary between seventy percent and eighty-eight percent, as found by Caucasian and Koss (as cited in Cornelius & Resseguie, 2007). Consistent with that, a study by Foshee and colleagues revealed that more girls than boys are exposed to psychological abuse, as well as to physical aggression, in middle schools (as cited by Avery-Leaf & Cascardi, 2002). As for rape and sexual assault, violent crimes are reported less frequently to law enforcement agencies (Catalano, 2005).

Gender differences are also evident in numerous studies, which document that females often report different types of abuse than males (Avery-Leaf & Cascardi, 2002; Foshee, 1996). As one study reports, thirty-three percent, or one in three adolescent girls, are victimized by a dating partner (Davis, 2008). Consistent with this, other research studies found that between thirty-two percent and sixty percent of girls experienced

dating violence (Rapp-Paglicci, Dulmus & Wodarski, 2004). Other studies indicate that forty percent of girls experienced mental abuse from their dating partners and that fifty-nine percent reported physical abuse (Wolfe, Wekerle, & Scott, 1997). However, the 2009 Youth Risk Behavior Survey Surveillance reported statistics detailing the race/ethnicity of the overall incidents of dating violence among female students as follows: African-Americans – 14.8%, Hispanics – 11.4%, Caucasians – 7.2% (CDC, 2010).

Interestingly enough, recent studies give controversial evidence indicating that in adolescence, girls as well as boys demonstrate abusive behaviors with their dating partners (Wolfe, Jaffe & Crooks, 2006). However, researchers still have different perspectives on this tendency and the majority finds that males are more violent than females. Many studies indicate that gender differences are directly connected with traditional gender roles in society, where men act as initiators of any intimate relationship and women accept masculine aggressive behavior because of cultural norms (Noonan & Charles, 2009).

The prevalence of dating violence incidents varies by race/ethnicity, according to the data of all studies and surveys that have been carried out over the last decades. The latest data demonstrate the different experiences among diverse ethnic groups. For instance, according to some research conducted in high schools among eighth and ninth graders, it was found that African Americans had been more frequently victimized physically in dating relationships than teenagers of other ethnic groups (Holt & Espelage, 2005). Makepeace and O'Keefe have found some variations for race/ethnicity with higher rates of perpetration revealed among African Americans and lower rates among Asians

and Latinos; Caucasians were in the middle of this range (as cited in NRCDV, 2004; Sugarman & Hotaling, 1989). In accordance with the 2009 Youth Risk Behavior Survey Surveillance, the overall incidents of dating violence were found to be higher among African-American (14.3 %) and Hispanic (11.5 %) students as compared with Caucasian (8 %) students (CDC, 2010). Thus, African-American students reported experiencing more violence in dating relationships than other groups. Therefore, many researchers raised an issue of identifying potential differences among target groups in launching prevention strategies by practitioners; in this case, the cultural interests and needs have to be taken into consideration (Noonan & Charles, 2009).

It is interesting enough to find out that seventy percent to ninety-three percent of dating violence episodes mostly happen in separate locations when the dating couples are not witnessed by others (Sugarman & Hotaling, 1989). In another report, forty-two percent of boys and forty-three percent of girls indicated that most abusive incidents take place in school buildings; in addition, fifty percent of girls reported sexual harassment at parties (NRCDV, 2004). As Makepeace reported in his study (1987), rates of dating violence vary by region; additionally, higher rates were discovered in urban inner city areas as compared to rural areas (as cited in NRCDV, 2004).

The role of bystanders in teen dating violence

Many researchers in recent studies draw attention to the role of bystanders and peers who witness incidents of abusive relationships in school settings. The importance of peers is connected with a transitional period from childhood to adolescence. This is where teenagers enter into more close relationships with each other by sharing plenty of

time together and joint activities outside home or school. For example, one in three teens reports knowing a friend who has been hit, punched, kicked, slapped or physically hurt by a partner (Liz Claiborne, Inc., 2005). Another survey states that more than half of teens between the ages of 13 and 18 know friends or peers who experienced different types of abuse; moreover, forty percent of girls between the ages of 14 and 17 know their peers are being victimized by dating partners (as cited by NRCDV, 2004).

In adolescence, teenagers find peers as more reliable persons to whom they can disclose their feelings and intimate experiences rather than to parents or school teachers. In most cases, those who experience dating violence usually turn to their friends for help in unsafe situations. For instance, according to one study, seventy-three percent of respondents reported that they would talk with a friend about an abusive relationship incident (Sugarman & Hotaling, 1989). Consistent with that, females are more likely than males to seek help by sharing their dating violence experiences (Liz Claiborne, 2005). However, it is questionable if those friends are competent in helping, giving any advice or making referrals.

Risk factors of teen dating violence

Researchers investigated the cause of dating violence and found that violence is connected with jealousy, uncontrollable anger, and emotional hurt. Both girls and boys reported jealousy and anger as the main causes of dating violence indicated by several studies (Sugarman & Hotaling, 1989; Wolfe, Jaffe & Crooks, 2006). Conflicts and quarrels in dating relationships are the strongest risks for violence according to the study of O'Keefe and Riggs (as cited in Averly-Leaf & Cascardi, 2002).

Most researchers have found that risk factors involving knowledge, attitudes, skills, and beliefs significantly predict aggressive behaviors. According to various studies, there are many risk factors that serve as predictors of aggression in dating relationships. Exposure to violence in different domains such as the home, the school or the community may serve as strong predictors of dating aggression, according to O'Keefe. Interestingly enough, another study indicates that a child abuse may play as a factor in relationships where physical punishment is considered a tolerable practice to employ against dating partners. The work of Chase et al., in looking at the risk factors of physical aggression with peers, claims that only males' hostility leads to aggressive behavior tendencies in dating relationships; along with that, in the study of Bookwala, the past dating aggression experience is another predictor to current violent behavior (as cited in Averly-Leaf & Cascardi, 2002).

The consequences of teen dating violence are also disruptive for teenagers. The problem severely impacts the health of teens because it entails harmful long-term consequences associated with risky behaviors – fighting, drinking, sleeping problems, depression, stress, and suicide attempts (Plitcha, 2004). However, one study reports that dating violence mostly affects girls and leads to unhealthy behavior connected with substance abuse, eating disorders, risk of suicide, low self-esteem and poor school attainment (Wolfe, Jaffe & Crooks, 2006).

Prevention of teen dating violence

A lack of knowledge about building healthy relationships and a lack of awareness of available legal options in unsafe situations might be possible reasons for the occurrence of teen dating violence (Schewe, 2002). Therefore, increasing knowledge among teenagers is one of the best ways to prevent teen dating violence. High school and middle school students have to know what a healthy relationship is, how to recognize abusive behavior in a dating relationship, and where to go in risky situations. Thus, increasing knowledge about building healthy relationships is very significant.

In addressing an alarming rate of teen dating violence, a variety of school-based prevention programs have been implemented in different states. A great number of teenagers are exposed to such programs every year. Since 1980 most school–based prevention programs have undergone various research studies (Durlak, 1995). Regardless of the overwhelming number of dating violence prevention programs that have been developed to prevent teen dating violence, their effectiveness is still little known.

There are different techniques and theoretical foundations utilized in prevention programs to address dating violence, and primary prevention is one type of them. Primary prevention programs target students and intend to preclude violence at the onset of dating relationships. In general, their common goal is to increase knowledge of students about teen dating violence. The curricula incorporate a diversity of activities to engage students in the learning process. Role-playing, lectures, and group discussions are integrated within each of the curricula. Most of the programs are one session and consist of presentations by guest speakers from the community agencies. Community agencies usually implement prevention programs in school settings because domestic violence experts are trained in this field and are more aware than school teachers of the nature of

the problem. Moreover, domestic violence experts may provide students information about available community resources and provide effective referrals for individuals who seek help from abusive dating relationships.

Many researchers have attempted to examine the effectiveness of primary prevention programs by utilizing different methods of analysis with involvement of control groups. Only some of them used self-report techniques. The studies were aimed at seeking an increase in knowledge or changes in attitudes and behaviors of teenagers in their dating relationships. Many researches included the pretest and the post-test design and found it to be one of the most convenient data collection methods in measuring knowledge and attitudes of program participants. For that reason, giving some examples of those evaluations carried out by researchers would be illustrative to see their contributions to this field.

Evaluation of teen dating violence prevention programs

The effectiveness of both short and long versions of dating violence prevention programs was revealed in the study of Lavoi and associates (1995) in which they assessed approximately five hundred male and female groups of students from high schools. The shorter program consisted of two sessions, and the longer one included multimedia presentations. The goal of the study was to assess changes in attitudes and knowledge as a result of these programs. After the pretest and the posttest, the females demonstrated a larger increase of knowledge of dating violence than males. The study results imply that both shorter and longer versions of primary prevention programs can be effective in increasing knowledge and changing attitudes related to dating violence.

Consistent with the abovementioned outcomes, another research study was employed by Jaffe and colleagues (1992) in four high schools with a random sample of students to examine the effectiveness of a half-day prevention program. The main goal of the program was to increase knowledge of dating violence and of warning signs of potential abuse, and to provide information regarding community resources for those who are in abusive relationships. The study developed a quasi-experimental pretest and posttest design with a self-report for assessing knowledge about dating assault, sex role attitudes, and behaviors. The posttest outcomes of the study revealed significant positive changes in knowledge, attitude, and behavior. The study showed differences between male and female attitudes about dating violence; the female participants showed more positive attitudes than male participants.

However, in Macgowan's (1997) findings, gender had no influence on changes in knowledge after the participation in the program. The study examined the effectiveness of a five-day session prevention program in a middle school with a sample size of four hundred forty students predominantly consisting of African-Americans. The main goal of the program was to help students to recognize dating violence, its causes, and its extent. The prevention program included various components, such as holding discussions about dating violence, building communication, and employing problem-solving skills. The research utilized a pretest and posttest design with a control group, and this design including self-report questionnaires that assessed knowledge and attitudes about types of dating violence. Outcomes of the study revealed that the treatment group scored significantly higher than the control group on the posttest, indicating a positive change in knowledge about dating violence and attitudes towards abusive relationships;

no changes were made in attitudes about physical violence. Although the scores showed progress in general, the analysis suggested that the program did not demonstrate changes in participants' behavioral responses to violence in intimate relationships.

In some evaluations of dating violence prevention programs, students improved significantly from the pretest to the posttest. Also, the researchers found gender differences before and after the program but did not assess long-term effects (Schewe & Bennet, 2002).

A huge number of prevention programs responding to various types of abuse in teen dating relationships have demonstrated promising results, mainly increasing knowledge about dating violence, changing norms, and improving communication skills. Even though many of these prevention programs have only been short-term interventions, the results are still encouraging.

Most prevention programs are limited to just evaluating the participants' knowledge and change of attitude through administering pretests and posttests, and only half of the practitioners collect qualitative data. Therefore, this study determined if the findings are consistent with other evaluation studies of dating violence prevention programs.

III. Methodology

Conceptual framework

Dating violence is defined by Levy (1991) as "a pattern of repeated actual or threatened acts that physically, sexually, or verbally abuse a member of an unmarried heterosexual or homosexual couple in which one or both partners is between thirteen and twenty years old" (as cited in the *Dangerous Choices I* program of the Women's Center and Shelter of Greater Pittsburgh, 2009). Various theories have been developed to study teen dating violence. However, the present study approached a socialization theory that explains the nature of teen dating violence and a program theory that explains a conceptual framework of prevention programs developed by practitioners.

Socialization theory

The theory of socialization is based on various other theories. Socialization is the process in which individuals obtain knowledge, skills, and traits that enable them to participate as active members of the society. The socialization theory explores people's life periods and for each period it identifies important elements which help in socialization processes. For example, in adolescence the socialization occurs through maturation processes. The main aspect of this life period is when adolescents take roles and start adapting to society by acquiring new skills, increasing their capacity, acquiring values, and taking on new obligations and responsibilities. All of these socialization processes can be possible only through "agents" and "agencies" such as school settings and social surroundings that slowly replace the family sphere of influence (Inkeles, 1969, p.625).

Socialization clearly involves the learning processes of individuals. Social learning theorists say that cognition plays a great role in learning. In his theory, Baldwin (1969) asserts that information gathering is another aspect of learning through which children become mature and socialized. In other words, children achieve a cognitive growth through acquiring and utilizing knowledge (Baldwin, 1969). And according to the social learning theory, individuals are guided by norms and rules through observing and imitating behaviors of others. These theories are empirical but explain the nature of information gathering by school students.

It is evident that children and adults are active participants in the socialization processes. Identifying determinants of socialization processes and analyzing outcomes within different contexts and domains is another approach of social scientists. The socialization theory explores roles and socio-demographic characteristics of social agents that influence socialization processes. Therefore, this study incorporated some explanations from research studies that enlighten the nature of gender socialization and factors for peer involvement during social interactions and the growth of a child.

Leaper and Friedman (2007) reviewed some theoretical approaches in explaining the socialization of gender and its major social influences in the development of children. In this regard, they examined social-structural, social-interactive, and cognitive-motivational processes. The social-structural perspectives claim that gender-related roles are stereotyped in a larger societal context and implicated in children's gender development. The social-interactive perspectives draw attention to practices of particular repetitive behaviors that stem from cultural and daily interactions that affect the growth of children. They reported that gender differences in relationships may stem from

childhood experiences, peer relations, and household responsibilities. From the cognitive-motivational point of view, children play an active role in their gender development due to their own observations and interactions and associate social roles with their own gender (Leaper & Friedman, 2007).

According to the study of Larson and Richards, adolescents spend most of their time with their friends and peers as opposed to with parents; therefore, peers may play a great role in socialization processes (as cited by Arnett, 2007). In addition, adolescents intentionally select friends with similarities; because of this, it is often believed that the influence of friends in adolescence is negative. Instead, adolescents are more likely to support their friends' previous similarities. In intimate friendships, adolescents find their friends as the closest persons with whom they share all their secrets; so with respect to the socialization processes, friends also play a significant role (Arnett, 2007). Through interactions with peers and classmates, adolescents are providing social skills to each other. Other evidence states that emotional attachments with friends are likely to enhance the chances that friends replicate each other's behavior (Wentzel & Looney, 2007).

Program theory

Among various theoretical approaches, social learning theory and feminist theory have been recognized and used by practitioners in most cases to understand abusive relationships. However, according to many studies, half of the prevention programs did not utilize any theoretical framework. Curricula of many prevention programs are different from each other because they are not standardized. Consequently, in many cases they are developed by practitioners across the United States. The programs are more

frequently designed in groups by staff members based on their perceptions and experiences.

Therefore, in order to understand the conceptual framework of prevention programs, the present study employed the program theory. The program theory is derived from the context of the logic model. Chen (2005) recommends the program-theory-driven approach to evaluation of prevention programs and explains it as "a specification of what must be done to achieve the desirable goals, what other important impacts may also be anticipated, and how these goals and impacts would be generated" (Chen, 2005, p.16).

The program theory is more practical a scientific theory because it is derived from implicit and explicit assumptions of stakeholders, whereas most scientific theories elucidate only causes of social phenomena. According to Chen (2005), the causal processes may be explained from the perspective of prescriptive and descriptive assumptions by stakeholders. The key role of stakeholders in the program theory is to design and direct any intervention program. Stakeholders prescribe components and activities of the program as critical toward the desired outcomes for the program. For example, in achieving the goals of the program they establish determinants of social problems and address them from their own experiences, observations, solid knowledge of problems, and skills.

However, many theorists replace the program theory with a logic model and interchange their meanings. In this regard, Chen clarifies the issue and gives a distinct definition for both of them: "[p]rogram theory is a systematic configuration of prescriptive and descriptive assumptions underlying a program, whereas the logic model stresses milestones like components" (Chen, 2005, p.34).

A logic model is a practical tool for describing the program theory. The logic model comprises critical contents of prevention programs to measure knowledge, and this model has been widely practiced in evaluations by many researchers. Usually, the efficacies of primary prevention programs are evaluated by outcome measures, which may include changes in knowledge, attitudes, and beliefs. In order to identify what measures to assess in outcomes, the researchers usually describe program content and measurable objectives (Schewe, 2002).

Overall, the program theory helps in understanding the ways the program achieved the results. In this sense, Chen (2005) made a comparison between programs based on scientific and stakeholder-implicit theories. He acknowledges that the scientific theory-based programs are well-examined and unproblematic for evaluators to identify determinants of any phenomena and to measure the effects of intervention. The main shortcoming of this theory is that it is too scientific and not realistic; it sometimes fails to meet stakeholders' interests.

With regard to the stakeholder-implicit theory, Chen (2005) notes that it is "not likely to be systematically and explicitly articulated, and so it is up to evaluators to help stakeholders elaborate their ideas" (p.41). However, he admits that regardless of the vague nature of the stakeholder-implicit theory, it is more practical and reflects the real world and the causal processes of social problems.

Operational definitions

In this study, the knowledge of students was measured through the pretest and the posttest administered in two secondary schools and de-identified by the Women's Center and Shelter of Greater Pittsburgh.

For this study, the dependent variable was "knowledge" about dating violence. **Knowledge** is defined in the *Dangerous Choices I* program as "information to recognize the various forms of abuse, to outline the dynamics of dating violence, and to identify options, if involved in an abusive relationship" (as cited in the *Dangerous Choices I* program of the Women's Center and Shelter of Greater Pittsburgh, 2009).

For this study, the dependent variables were total scores from the pretest and the posttest, which were coded as "totalpretest" and "totalposttest." The independent variable such as "race/ethnicity" was defined and coded in the following ways: African-Americans as "1," Caucasians were coded as "2," and Bi-Racials as "3." The next independent variable "school" was labeled as "school 1" and "school 2."

The questionnaire included items with open-ended questions and multiple-choice options. The correct answers were coded as "1," and incorrect answers were coded as "2." All correct options on some items were grouped in separate variables and labeled for further analyses. For example, the pretest and posttest items were labeled in the following way: the first item "*List three examples of mental abuse"* was coded as "prementabuse" on the pretest and "postmentabuse" on the posttest; the second item "*How many teens are involved in abusive dating relationships"* was coded as "preabusivedating" on the pretest and "postabusivedating" on the posttest; the third item "*Why would a person abuse their partner"* was coded as "preabusepartner" on the pretest and "postabusepartner" on the

posttest; the fourth item "*Why do victims stay in abusive relationships"* was coded as "prestayabuse" on the pretest and "poststayabuse" on the posttest; the fifth item "*Identify the three phases in the cycle of violence"* was coded as "prephasescycle" on the pretest and "postphasescycle" on the posttest; the sixth item "*Which of these are warning signs that your relationship may become abusive"* was coded as "prewarningsigns" on the pretest and "postwarningsigns" on the posttest; the seventh item "*If you know a friend that is experiencing abuse in their relationship, which of the following would be helpful"* was coded as "prehelpabuse" on the pretest and "posthelpabuse" on the posttest; the eighth item "*You can get a Protection from Abuse (PFA) against which of the following people"* was coded as "prePFAagainst" on the pretest and "postPFAagainst" on the posttest; and the ninth item "*You can get a PFA in which of the following situations"* was coded as "prePFAsituations" on the pretest and "postPFAsituations" on the posttest.

Finally, another dichotomous dependent variable was created by grouping lowest and highest scores on the total pretest and posttest scores for further analyses, which was accordingly coded as "lowscores" and "highscores". This variable was used for the Chi-square test for independence of groups to find any relationship between variables as race/ethnicity and knowledge.

Research Design

The sample for this study was comprised of seventy-one female students of ninth grades from two public schools in Pittsburgh. The *Dangerous Choices I* program was implemented by the Women's Center and Shelter of Greater Pittsburgh in secondary schools during health classes of the spring academic term (from January to May of 2010).

The sample predominantly consisted of students who were African-American – 50 (70.4 %), Caucasian 17 – (23.9 %), and Bi-Racial – 4 (5.6%). In addition, the sample represented two secondary schools. Out of the total sample size, *School 1* included thirty-three percent of students, and *School 2* included sixty-two percent of students.

This study utilized the pre-experimental design with the pretest and posttest design. The population was homogenous in age and gender; it varied only in race/ethnicity. Race/ethnicity and schools were independent variables for the analysis; therefore, it was possible to evaluate how different participants responded and to assess how the program affected them.

Several hypotheses were tested in this study to identify the changes and effect of the program. *Knowledge* was the dependent variable. With each variable tested, a null hypothesis was applied stating that there was no difference from participating in the program and there was no relationship between variables.

Hypotheses:

(H_o): There is no statistically significant difference in scores obtained from the pretest to the posttest by participants of the program.

(H_o): There is no statistically significant difference between the mean scores of two schools on the pretest and the posttest.

(H_o): There is no statistically significant difference between the mean scores of different groups by race/ethnicity on the pretest and the posttest.

(H_o): There is no statistically significant relationship between race/ethnicity and knowledge.

With regard to the questionnaire, the hypothesis suggested that students would score positively on each test item before and after participation in the *Dangerous Choices I* program. In this regard, the study analyzed frequencies of responses to each item of the questionnaire.

Data collection

Nine items of the questionnaire were assessed for measuring changes in scores; in other words, to determine whether the students' knowledge increased and the students' attitudes changed. The questions of the tests consisted of multiple choices, including two open-ended questions. Questions reflected the content of the *Dangerous Choices I* program covering such main components as:

1. Definition of teen dating violence, types of abuse;
2. Prevalence of teen dating violence, warning signs of abusive behavior;
3. Awareness of strategies and resources, if one experiences or witnesses teen dating violence;
4. Awareness of legal rights of a help-seeker in abusive relationships.

All the data set had been de-identified by the Women's Center and Shelter of Greater Pittsburgh for maintaining the confidentiality of participants.

Data analysis

The data were analyzed to evaluate the impact of the program on increasing knowledge about teen dating violence. Various statistical models were employed for analysis in this study. Total scores of the pretest and the posttest helped to determine if the program produced positive changes in knowledge of participants, thus indicating the effects of the program.

A paired-samples t-test was launched to test the null hypothesis that there was no significant difference in total scores on the pretest and the posttest. The null hypothesis was tested by establishing $p < .05$ significant level. In case the difference in total scores was significant statistically, the null hypothesis had to be rejected and concluded that the program had an effect on knowledge increase about teen dating violence.

An independent-samples t-test helped to test another null hypothesis that there was no statistically significant difference between the mean scores of two schools before and after the program. In case the difference in mean scores was large enough, the null hypothesis had to be rejected and concluded that the schools were different.

An independent-samples t-test helped to test another null hypothesis that there was no statistically significant difference between the mean scores of different groups by race/ethnicity before and after the program. In case the difference in mean scores was large enough, the null hypothesis had to be rejected and concluded that the groups were different.

The study also sought to establish any statistical relationship between knowledge and race/ethnicity. The study tested this hypothesis by employing a Chi-square for this association to find whether race/ethnicity affected knowledge. In this regard, the total

scores of the pretest and the posttest were split into two groups with high and low scores for comparisons. By computing column percents, the bivariate relationship was examined in more detail in order to analyze how the independent variable affected the dependent variable.

In addition, items of the questionnaire developed by the program staff of the WC&S were analyzed in this study. In this regard, the frequencies of responses on each item of the questionnaire were inspected from the pretest to the posttest to determine positive changes that occurred in participants. This kind of analysis allows making inferences about the impact of the program and how well the components of the program were reflected in the questionnaire.

Implications of the study results are useful and practical for developing appropriate prevention strategies and further modification of the program. The study results assessed if the program was effective in increasing the knowledge for preventing teen dating violence.

IV. Findings and analyses

This part is divided into two sections, both of which attempt to answer the research questions and interpret the results obtained. The interpretations mostly relate to the theoretical framework and the literature review.

The first section covers the analysis of findings related to the items of the questionnaire, and the second section utilizes the findings from quantitative analysis. Inspection of the questionnaire items was performed by looking at the percentage of frequencies of correct responses to each test item before and after the participation in the *Dangerous Choices I* program. The results for each item have been yielded using the following research questions:

1. Is there a difference in total scores on test item, "*List three examples of mental abuse"* among students before and after the participation in the DCI program?

The first item of the questionnaire was an open-ended question asking the students to list three examples of mental abuse. During pretest, many students were not able to give these examples, and it was very difficult for them to even guess. Therefore, we can observe that about forty-eight percent of students named psychological types of abuse and forty-two percent of participants did not answer at all to this question (See Table 1). The examples given by students – for example, "name calling," "putting down someone," and "saying hurtful things" – were correspondingly grouped into four categories: psychological, physical, sexual, and psychological and physical abuse. None of the participants listed financial types of abuse. In some parts, they gave only two examples of mental abuse. The posttest results indicated that nine students (13%) could only list three

examples of mental abuse after the program; the majority (66%) of them could name fewer than three examples.

2. Is there a difference in total scores on test item, "*How many teens are involved in abusive dating relationships"* among students before and after the participation in the DCI program?

The second item of the questionnaire required students to choose one of four answers by defining the number of teens involved in abusive dating relationships. The item included some statistical data in order to identify if the students had information about the prevalence of dating violence among teenagers. The correct responses increased from forty-eight percent to eighty-six percent before and after the participation in the program. The incorrect answers decreased from fifty-two percent to fourteen percent (See Table 2). The data had no missing values, thus indicating full participation of students on this item of the questionnaire.

3. Is there a difference in total scores on test item, "*Why would a person abuse their partner"* among students before and after the participation in the DCI program?

The third item of the questionnaire asked for reasons why people might abuse their partners in specific situations. In this regard, the point of this item was to identify if the students understood these reasons. They were asked to choose one answer out of four options given in this item. Having looked at the pretest and posttest results from the tables, it was obvious that changes in the knowledge of students occurred slightly, but not considerably (from 76% to 80%) in giving correct answers (See Table 3).

4. Is there a difference in total scores on test item, "*Why do victims stay in abusive relationships"* among students before and after the participation in the DCI program?

The fourth item included seven options out of which students had to choose four correct answers. As the test results showed, the knowledge significantly increased among students in listing all four correct answers from thirty percent to sixty-nine percent (See Table 4). However, students still faced some difficulties in defining all four correct answers. One student did not answer this question at all.

5. Is there a difference in total scores on test item, "*Identify the three phases in the cycle of violence"* among students before and after the participation in the DCI program?

The fifth item of the questionnaire was an open-ended question asking the students to identify three phases in the cycle of violence. As we can see from the tables, many students during pretest were not able to give these examples at all, and it was very difficult for them to even guess (See Table 5). Thus, we can observe that about twenty percent of students listed examples incorrectly and eighty percent of students did not answer this question at all. After looking at posttest results, we can find that the picture changed dramatically, indicating an increase from zero to fifty-two percent in identifying the violence cycle phases. Another group of students (32%) could only name fewer than three examples, but the data still revealed that approximately sixteen percent of students did not answer this question at all on the posttest.

6. Is there a difference in total scores on test item, "*Which of these are warning signs that your relationship may become abusive"* among students before and after the participation in the DCI program?

The sixth item was designed to determine the level of students' awareness of warning signs of abuse in dating relationships, and it listed seven correct options. The students were required to circle choices that described warnings signs of abuse in dating relationships. According to the pretest and posttest results, we can assume that this item of the questionnaire was the most difficult question before and after the program, because no students gave all seven correct answers even on posttest (See Table 6). Therefore, for this item of the questionnaire, we would consider six correct answers as the highest possible increase in knowledge. In this regard, the knowledge had changed for only three percent from the pretest to the posttest. However, students who gave five correct answers were still considered successful, and this increase occurred from seventeen percent to twenty-five percent (See Table 6). Interestingly, the category of students who could give four correct answers remained stable from the pretest to the posttest at thirty-one percent. The data displayed one missing answer on the posttest.

7. Is there a difference in total scores on test item, "*If you know a friend that is experiencing abuse in their relationship, which of the following would be helpful"* among students before and after participation in the DCI program?

The seventh item aimed to determine the level of awareness of help-seeking situations and the role of bystanders. This item required choosing options that best describe students' actions taken in cases where their friends experienced abuse in relationships. The item was comprised of four correct answers out of eight listed ones. From the pretest

to the posttest, we can observe that the level of awareness increased among students from thirty-five percent to fifty-five percent (See Table 7). No students were able to list all four possible answers on the posttest, but all gave two or three correct ones.

8. Is there a difference in scores on test item, "*You can get a Protection from Abuse (PFA) against which of the following people"* among students before and after participation in the DCI program?

The eighth item of the questionnaire sought to identify the students' level of awareness about legal options for people who experience abuse in dating relationships and against whom victims could apply the forms of Protection from Abuse (PFA). Six examples were given in the item, out of which three examples were correct and were to be circled by students. According to the test results, students' awareness of legal options increased from forty-four percent to forty-eight percent after the program, so they could list all three correct answers; this increase was slight and not considerable (See Table 8). The results on giving two correct answers changed with a larger effect – from twenty-seven percent to forty-one percent from the pretest to the posttest, which indicated an increase in their knowledge for fourteen percent on this item. It is notable that almost half of the students knew about the existence of PFA forms before the program. On the pretest, two students did not answer this question.

9. Is there a difference in scores on test item, "*You can get a PFA in which of the following situations"* among students before and after participation in the DCI program?

The ninth item of the questionnaire explored the students' degree of knowledge about situations in which people might claim PFA. The item included five possible options out

of which the students were expected to choose two correct answers. Four students refused to answer this question on the pretest and one did not answer on the posttest. After observing the tables, it was evident that students demonstrated a moderate level of increase from sixty-six percent before the participation in the program to seventy percent after that (See Table 9). Interestingly, the number of students who gave only one correct answer remained stable (28%) on both pretest and posttest. It is also worthwhile to point out that this item, like the previous one, showed only four percent increase in knowledge and that more than half of students were able to answer this question on pretest.

Taken together, the total pretest results showed that the range of scores was from 4 to 20 (M=14.31, SD=3.13), with a median of 14.00 among 71 female high school students. The distribution of scores was somewhat negatively skewed. The total posttest results ranged between 5 and 20 (M=16.44, SD=2.93), with a median of 17.00. The distribution was again non-symmetric and slightly skewed to the negative side.

A paired-samples t-test results based on total pretest and posttest scores

The second part of this section included the findings of quantitative analyses to the research questions and hypotheses. All statistical techniques utilized in this study aimed to determine if the program had any effect on knowledge increase.

The first null hypothesis stated that *(H_o)*: There is no statistically significant difference in total scores obtained from the pretest to the posttest by participants of the program. If the difference in the total scores from the pretest to the posttest was large enough, the null hypothesis would be rejected and concluded that the program had an effect on knowledge increase. For testing this hypothesis, a paired-samples t-test was

applied because it compared the means of the same group from one occasion to another. In our case, the total sample size was comprised of 71 female students from two high schools. Since they were not the same groups, the sample was split into two groups by school differentiation – *School 1* and *School 2*.

Before running a paired-samples t-test, it was necessary to look at the distribution of scores for its normality through a Kolmogorov-Smirnov test. This test explains the normality of distribution by a non-significant value. On both pretest and posttest, the scores indicated violation of the assumption of normal distribution with the significant values of $p < .001$. In order to improve a non-symmetrical distribution, another alternative such as transformation of variables is usually employed by statisticians; however, it is not recommended by many researchers for avoiding much confusion and misinterpretation of findings. Therefore, in this study it was just acknowledged the fact that the distribution was roughly normal and hypotheses were tested by running a paired-samples t-test including non-parametric ones.

A paired-samples t-test revealed a statistically significant increase in test scores for *School 1* from the pretest (M =14.19, SD=3.85) to the posttest (M=17.11, SD=3.21), t (26) = 5.717, p<.05. The mean increase in test scores was 2.93 with a 95% confidence interval ranging from 1.87 to 3.98 (See Table 10). The eta squared statistic (.56) indicated a large effect, with a substantial difference in the knowledge scores obtained before and after the program.

For *School 2*, a paired-samples t-test revealed a statistically significant difference in test scores from the pretest (M =14.39, SD=2.63) to the posttest (M=16.02, SD=2.72), t (43) = 3.408, p<.05. The mean increase in test scores was 1.64 with a 95% confidence

interval ranging from 0.67 to 2.60 (See Table 11). The eta squared statistic (.23) indicated a medium effect, with a slight difference in the knowledge scores obtained before and after the program.

Supposedly, due to a roughly normal distribution of data, there was still a doubt for the paired-samples t-test outcomes; in that case, the hypothesis can be tested through another option by a non-parametric test – a Wilcoxon Signed Rank Test. This technique compared ranks instead of means from the pretest to the posttest for both schools. A Wilcoxon Signed Rank Test revealed a statistically significant difference in obtained scores for *School 1* following participation in the prevention program, z= -3.91, p<.05, with a large effect size (r=0.53) (See Table 12). The median score of 15 on the pretest increased to 18 on the posttest. For *School 2*, a Wilcoxon Signed Rank Test revealed a statistically significant difference in obtained scores, z= -3.02, p<.05, with a medium effect size (r=0.32) (See Table 13). The median score was 14 on the pretest and increased to 17 on the posttest.

Independent-samples t-tests between schools

An independent-samples t-test helped us to test our next null hypothesis *(H_o)*: There is no statistically significant difference between the mean scores of two schools on total pretest and posttest scores of participants of the program. If the difference in the sample means was large enough, the null hypothesis could be rejected and concluded that the scores were different between schools. Before interpreting the independent-samples t-test, we had to look at the Levene's test for homoscedasticity of two groups. In the present sample, F=2.782, with a level of significance of .100, this result indicated that the

two sample variances have been equal. Subsequently, the independent-samples t-test showed that the results were not statistically significant by t (69) = .261, p>0.05, indicating no difference among mean scores of two schools on the pretest (See Table 14). There were 27 students in *School 1*, and the mean score was 14.19, with a standard deviation of 3.853. The other group of 44 students from *School 2* had the same mean score of 14.39, with a standard deviation of 2.634. All in all, the total pretest results showed no significant difference between two schools.

Accordingly, the same hypothesis was tested based on posttest results. On the posttest, by looking at the Levene's test, it was found that F=.073, with a level of significance of .788. Consequently, this result indicated that the two sample variances were equal. The independent-samples t-test revealed that the results were not statistically significant by t (69) = 1.531, p>0.05, indicating no difference on mean scores of two schools from the posttest (See Table 15). The independent-samples t-test reported that on the posttest the 27 students from *School 1* averaged by 17.11 mean score, with a standard deviation of 3.215. The other group of 44 students from *School 2* obtained a mean score of 16.02, with a standard deviation of 2.706. All in all, the posttest results showed no significant difference between two schools after the program.

Independent-samples t-tests between different groups by race/ethnicity

Our next research question was whether the scores of students were different by race/ethnicity before and after the participation in the program. Thus, the null hypothesis stated that *(H_o)*: There is no statistically significant difference in mean scores between two different groups by race/ethnicity on the pretest and the posttest. This hypothesis has

been tested through the independent-samples t-test as well; if the difference in mean scores was large enough, the null hypothesis could be rejected and concluded that the mean scores were different across race/ethnicity.

Before running the independent-samples t-test, it was necessary to mention that the total sample size of 71 students had the following race/ethnicity breakdown: fifty African-American students, fourteen Caucasian students, and four Bi-Racial students. Since the Bi-Racial students constituted the smallest part of the proportion in the sample size and in order to avoid extreme distortion of our findings in comparing mean scores between race/ethnicity categories, it was decided to merge them into one of the abovementioned groups. In this regard, Bi-Racials were included in the Caucasian group for increasing the representation of that group for further analyses.

On the pretest, the mean score of African-Americans in the sample was 14.60, with a standard deviation of 2.864. However, the Caucasians obtained a mean score of 13.62, with a standard deviation of 3.667. The Levene's test indicated F=.645, with a level of significance of .425, resulting in equality between two sample variances. Subsequently, the independent-samples t-test showed that the results were not statistically significant by t (69) = 1.210, p>0.05, indicating no difference among mean scores between Caucasians and African-Americans on the pretest (See Table 16). Taken together, the pretest results showed no significant difference between Caucasians and African-Americans.

On the posttest African-Americans had a mean score of 16.22, with a standard deviation of 2.690. The Caucasians averaged 16.96, with a standard deviation of 3.471. The Levene's test resulted in F=.189, with a level of significance of .665, indicating

equality between two sample variances. Consequently, the independent-samples t-test showed that the results were not statistically significant by t (69) = .959, p>0.05, indicating no difference among mean scores between Caucasians and African-Americans on the posttest (See Table 17). Taken together, the posttest results showed no significant difference between Caucasians and African-Americans.

Chi-square test results for group independence

Another statistical technique helped to test a measure of association for group independence. The research question determined if there was a significant relationship between variables or, in other words, whether the test performance was dependent on race/ethnicity. This hypothesis was almost similar to the previous one, but through an independent-samples t-test, the differences in mean scores were explored across race/ethnicity. The hypothesis, by convention, tried to determine if the knowledge was affected by race/ethnicity, thus stating:

(H_o): There is no statistically significant relationship between race/ethnicity and knowledge. In this regard, the test of Chi-square would establish that relationship. For that reason, the scores were split into two groups with high and low scores for comparisons. By computing column percents we were able to examine the bivariate relationship in more detail and to observe how an independent variable affected the dependent variable. As mentioned earlier, the four Bi-Racial participants were included in the Caucasian group under the race/ethnicity category in order to roughly adjust our sample size.

Inspection of the cross-tabulation table indicated that forty-eight percent of African-American and forty-three percent Caucasian students reported high scores on the pretest. In this case, the column percent revealed that there was no significant difference between these two groups in their performance. A Chi-square test for independence (with Yates Continuity Correction) indicated no significant association between race/ethnicity and knowledge increase, χ^2 (1, n = 71) = .018, p = .89, phi = – .04 (See Table 18). This was greater than the standard indicator of a significant result p = .05, so it was concluded that there was no statistically significant relationship between race/ethnicity and knowledge. Increase in knowledge was independent of race/ethnicity on the pretest results.

However, a slightly opposite picture was observed on the posttest results after inspection of the cross-tabulation table. It revealed that fifty-four percent of African-American and fifty-seven percent of Caucasian students reported high scores on the posttest. In this case, the column percent disclosed that there was no difference between these two groups in their performance. A Chi-square test for independence (with Yates Continuity Correction) indicated no significant association between race/ethnicity and knowledge increase, χ^2 (1, n = 71) = .000, p =1.00, phi = –.029 (See Table 19). This was greater than the standard indicator of a significant result p = .05, so it was concluded that there was no statistically significant relationship between race/ethnicity and test performance on posttest. Increase in knowledge was independent of race/ethnicity on the posttest results.

V. Discussion and implications

As we observed, each item in the questionnaire positively changed by yielding higher frequencies of responses from the pretest to the posttest. The general outcome supported the socialization theory, that through the learning processes, individuals acquire knowledge, skills, and traits that enable them to adjust with norms and values of society. As Baldwin (1969) observed, information gathering is an important aspect of learning. Thus, this prevention program helps teens to internalize and exhibit healthy relationships through cognitive processes. This explanation also is consistent with the implicit goal of this program, which is not only to increase knowledge about teen dating violence, but also to facilitate teens smoothly into maturation and socialization processes. In the *Dangerous Choices I* program, students were taught how to identify types of abuse and recognize warning signs of abuse; they also acquired information about the prevalence of dating violence and available resources, such as legal options in unsafe situations; they learned to acknowledge the role of bystanders as well. The level of knowledge before and after their participation in the program changed positively on responses to each item. Each item of the questionnaire was inspected to determine which parts of the content were strong and comprehensive and which ones were weak. Most parts of the questionnaire reflected the content of the prevention program. The questionnaire consisted of nine items that students had to answer before and after the participation in the program. Each item had various options from open-ended questions to multiple choice questions; therefore, some items of the questionnaire were much too hard for students to answer.

Having looked at each item of the questionnaire, some assumptions could be made upon their results. The first item of the questionnaire asking the students to list three examples of mental abuse was a little bit complicated. On the pretest, many students were not able to list three examples and they gave various responses. Therefore, common answers were arranged into several categories. The pretest results revealed that female students had some experience of a dating relationship and had some knowledge about types of abuse. From what we observed, forty-eight percent of students named a verbal type of abuse, which means that this type of abuse might be very common or typical among their peers. This finding is also consistent with the literature that shows that teenagers predominantly experience verbal or mental types of abuse in their dating relationships (Avery-Leaf & Cascardi, 2002; Foshee et al., 1996; Levy, 2006; Wolfe, Wekerle & Scott, 1997).

However, on the posttest only nine students (13%) could list three examples of mental abuse after the program. It is interesting that still twenty-one percent of students left this question unanswered. Their unwillingness to answer this question could mean that they did not memorize the examples or that the definitions were too difficult to comprehend. In terms of the complication level of the questionnaire, the results indicated that this item was relatively hard to answer in general. For example, on this open-ended question, students scored a zero on the pretest. We may assume that this item was intentionally chosen by the Program Director to discover the level of knowledge about types of abuse among students. Thus, we could see that the students did not know about the content of the program and the nature of abusive relationships.

Giving some statistical data is essential for students to understand the prevalence of the problem of teen dating violence. Therefore, the second item required students to define the number of teens involved in abusive dating relationships. It is interesting that during the pretest students made good guesses. This item displayed a thirty-eight percent increase in knowledge before and after the participation in the program. This was the third highest result among all items that showed a major positive change in the knowledge from the pretest to the posttest among participants.

The main objective of the third item of the questionnaire was to determine the level of awareness among students about the reasons that people might abuse their dating partners. This part of the questionnaire displayed the greatest percentage (76%) of correct responses given by students before being exposed to the program. The results showed that participants already knew a great deal about possible answers to this question. Since our sample size consisted of female students, it can be interpreted that these findings were consistent with the literature about gender differences; they reported more females than males being victimized by a dating partner (Avery-Leaf & Cascardi, 2002; Davis, 2008; Foshee, 1996; Sugarman & Hotaling, 1989). Socialization theory also extends the possible explanation. It asserts that from the social-structural perspectives, the gender-related roles are stereotyped in a larger societal context and affect the growth of children (Leaper & Friedman, 2007). It is also consistent with findings about traditional gender roles and cultural norms related to the aggressive behavior of men in some studies (Noonan & Charles, 2009). Therefore, this kind of prevention program is beneficial for both genders to identify possible reasons that might lead to unhealthy dating relationships. This item of the questionnaire reported only a four percent increase of

knowledge on the posttest. The reason for this result is that the majority already responded with a high percentage on the pretest. Thus, the posttest results did not display a major increase on this item.

Consequently, the fourth item of the questionnaire was a somewhat related to the previous one and required students to identify reasons of why victims stay in abusive relationships. From the results, we could see that this question was complicated because it had four correct answers out of seven options. Students were confused even after the participation in the program because the range of their correct answers fell between one and three. As the test results showed, the knowledge significantly increased among participants for thirty-nine percent from the pretest to the posttest. It is remarkable that on the pretest the most frequent answers of students concur with the findings of literature that fear and love are the dominant reasons for why victims stay in abusive relationships (Sugarman & Hotaling, 1989; Wolfe, Jaffe & Crooks, 2006). This may be interpreted that the girls had enough experience of dating relationships.

The fifth item of the questionnaire was the most complicated part of all. First of all, it was an open-ended question, and secondly, it required the participants to give three phases in the cycle of violence. The term "cycle of violence" was definitely difficult to answer; as a result, the students appeared to be confused and once again identified mental types of abuse. Therefore, all participants of the program were not able to answer correctly this question and scored zero on the pretest. However, on the posttest, they demonstrated better results by an increase in knowledge of fifty-two percent. This substantial change was recorded, among other results, as the highest one before and after the participation in the program. Nevertheless, this item was considered the most

complicated one even after the posttest because the teenagers were still confused with the three phases in the cycle of violence. Having looked at the pretest results, we can observe that teens had a lack of knowledge about the nature of dating violence. Obviously, the main objective of this item – to raise awareness of phases in the cycle of violence – has been achieved successfully.

The most interesting picture was observed with the sixth item, which was unique among all other items in the questionnaire. First of all, the main task of the program content related to this item was important – to disseminate knowledge about the warning signs of abuse in the dating relationships. This part of the program is very critical for teens to recognize warning signs of abuse in dating relationships. Secondly, the item was confusing for students because all seven answers were correct. Therefore, this item did not show positive changes because no students chose all correct answers even after the participation in the program. However, one student correctly answered on the pretest by circling all given options and failed to do the same after the program. We may assume that this student made a good guess the first time. Thus, increase in knowledge might be counted for giving six correct answers. In this case, only three percent of participants could name warning signs of abuse by giving six correct responses. The average number of students mostly named two or three correct answers. We might be concerned here with the results of this item, because it suggested that the part of the content about warning signs of abuse was too difficult to perceive for participants or they were not fully explained during presentation.

The seventh item was an important part of the questionnaire because it addressed the help-seeking behavior, and it required the students not only to identify the options in

which bystanders can help peers but also to understand the key role of bystanders to intervene in unsafe situations. From the pretest to the posttest, the increase in knowledge occurred for twenty percent. It is worthwhile mentioning that pretest findings were consistent with socialization theory and findings from the literature. For example, on the pretest the responses to the question concerning which options would be helpful to a friend who experienced an abusive relationship, the most popular answer (65%) was "*helping them to be safe*" and another prevailing answer (63%) was *"listening and supporting."* This may be interpreted that teenagers have had sufficient knowledge of how to respond if peers seek help or support from abusive relationship. Socialization theory asserts that peer influence is critical in socialization processes and that interactions are more enhanced in adolescence with peers rather than with other social agents (Arnett, 2007; Wentzel & Looney, 2007). Along with that, according to recent studies, the role of bystanders and peers who observe episodes of abusive relationships in school settings is critical to making referrals or giving advice for those who seek help (Noonan & Charles, 2009).

The eighth and ninth items were almost identical in the questionnaire and aimed to identify the level of awareness about the Protection from Abuse (PFA) order forms. The results showed that students already had an idea of what the PFA form is and in what situations and against whom to claim it. It is worthwhile to note that both of these items recorded the same results in knowledge increase for only four percent among participants from the pretest to the posttest. However, the difference is observed on results before the participation in the program. For instance, according to the pretest results, students demonstrated less knowledge on the eighth item than on the ninth item. The responses to

the eighth item indicated that before the program, the students had little information about whom one could file the PFA form against. On the pretest, forty-four percent of the students answered that question correctly. In contrast, on the ninth item they demonstrated sixty-six percent of knowledge about situations in which the PFA form is claimed. It is particularly interesting that almost half of students knew about the existence of the PFA forms before they had been exposed to the program. We can assume that they might have information from older students or from their parents. Another possible interpretation is that teenagers occasionally encounter or witness various incidents of dating violence in school settings and are well-informed about resources or legal options in unsafe situations.

Overall, the results on each item indicated some positive changes in the present study. Students positively increased knowledge on almost each item by identifying types of abuse, recognizing warning signs in abusive relationship, demonstrating knowledge on how they would help friends in unsafe situations, and about available legal options. Only one item of the questionnaire was not responded to correctly by any of the students. The item might be too complicated or confusing and needs further modification.

Furthermore, other hypotheses were tested by utilizing various statistical techniques for significant differences among groups and across time. The employment of a paired-samples t-test on testing the outcome scores from the pretest to the posttest of two schools indicated a statistically significant increase in knowledge about teen dating violence among students after the participation in the program. A Wilcoxon Rank Test revealed that the median scores of *School 1* ranked a little higher than the median scores of *School 2*; however, *School 2* outnumbered *School 1* by a sample size. Both schools

demonstrated almost similar outcomes from the pretest to the posttest. Thus, the findings proved the effectiveness of the program on increasing knowledge about teen dating violence among students.

Moreover, these findings support our conceptual framework on the logic model theory, which is derived from the program theory. The logic model explains practically the effectiveness of primary prevention programs by outcome measures. In this regard, stakeholders are key players who prescribe essential components and activities of the program toward the desired results of the program (Chen, 2005). Therefore, changes in knowledge and attitudes are considered as desired outcomes of many primary prevention programs. Typically, in most cases, these kinds of programs are not based on scientific theories and are well-explained by the logic model by practitioners because it elucidates the characteristics, content, and goals of such programs (Schewe, 2002). In this case, the *Dangerous Choices I* program aimed to increase knowledge about teen dating violence among school students after the participation in it and achieved those goals successfully based on the present study data.

Furthermore, the findings are consistent with other research on the evaluation of prevention programs across the states. This study revealed the effectiveness of the program in achieving significant positive changes by increasing the knowledge of students after participation in the program. This study finds evidence that the short-term prevention program *Dangerous Choices I* has been found as effective as other programs aiming at increasing knowledge of students about teen dating violence and changing their attitudes and behavior.

Interestingly enough, the next hypothesis on finding the differences in mean scores between the two schools before and after the program through an independent-samples t-test revealed no statistically significant differences. The mean scores on the pretest of both schools were equal. It confirmed that students from both high schools were exposed to the program for the first time and did not know much about the content, components, and procedures of the program. On the other hand, after the exposure to the program on the posttest, students of both schools had slight discrepancies in their scores. The independent-samples t-test reported for *School 1* a mean score of 17.11 with a standard deviation of 3.21, and for *School 2* a mean score was 16.02 with a standard deviation of 2.71. But that difference was not statistically significant. Taken together, we may conclude that the *Dangerous Choices I* program is replicable and could be used in other school districts. It is effective in increasing students' knowledge about teen dating violence.

To our surprise, the next hypothesis of this study seeking to find any differences in mean scores between different groups by race/ethnicity did not reveal any statistically significant evidence to prove that. As recommended by Noonan and Charles (2009), practitioners needed to adjust and design prevention programs and take into consideration potential differences among target groups including cultural diversity. Respectively, this study sought to explore the difference in mean scores from the pretest and the posttest between two groups: African-American and Caucasian students. Despite the fact, that many studies observed some differences in race/ethnicity, the present study did not support that hypothesis and assumption. No statistically significant difference in mean scores was observed on both pretest and posttest results through an independent-samples

t-test. On the pretest, a minor variation in their means was observed between these two groups – the mean score for African-American students was 14.60 (*SD*=2.86) and for Caucasians the mean score was 13.62 (*SD*=3.67). It is obvious that African-Americans were succeeding in this case. Controversially, the mean scores on the posttest were approximately identical for both groups, although initially, African-American students outnumbered Caucasians in the sample size. As a whole, the test reported that the difference was not statistically significant.

The Chi-square was helpful for our last hypothesis to establish the relationship between knowledge and race/ethnicity. We presupposed that this association would help to figure out if race/ethnicity affects the knowledge. The Chi-square test results did not support the hypothesis or that relationship; thus, it was concluded that race/ethnicity does not affect knowledge. After all, we can conclude that race/ethnicity may be an important variable and factor of influence in other contexts and domains, but it was not in this one.

VI. Limitations

The sampling size was a limiting factor. The sample was limited to two school districts; it was small and included only female subjects. Therefore, the study did not utilize rigorous statistical techniques due to the unavailability of most common variables such as: age and gender representation, socio-economic status, family structure, etc.

Another limitation of the study was that it did not employ any control group or randomization of a sample. Consequently, the findings cannot be generalized.

The unavailability of the data from previous years made it difficult to conduct a serious analysis, too. For instance, looking at previous data would be valuable to explore the long-term effectiveness of the program, which would be one of the most important indicators of a meaningful change.

Since all prevention programs are un-standardized ones, this was another limitation for the study to analyze the content of this prevention program. The primary prevention programs have various components, duration, and target groups, meaning that it was impossible to match them with one another. Therefore, it was futile to analyze the content of the program in terms of its comprehensiveness and fullness.

Along with that, this research study did not seek to analyze the internal consistency of the test scale for reliability, because the questionnaire was not based on a scientific theory or on any psychometric instrument. In addition, some item responses consisted of single or multiple-value response options, which made internal consistency impossible. Ideally, a scale should consist of a set of multiple items that correlate well with each other and are tested by special methods for computing reliability. Therefore,

the reliability of a testing scale was not carried out due to the small sample size and an inept testing scale.

Many prevention programs utilize different instruments and methods for measuring effectiveness and evaluation of programs. This study employed the results of the pretest and the posttest only, which are not enough to measure any behavioral changes of participants.

VII. Future research/Policy recommendations

Administering the pretest and the posttest design is not a sufficient tool for measuring changes in knowledge and attitudes towards teen dating violence among participants. Further research is needed to develop a depth of understanding the differences in attitudes and behaviors of participants if they occurred due to the participation in the program or other factors. Therefore, it is critical to measure the desired outcomes to provide proper evidence.

However, some additional steps might be considered for successful achievement of those outcomes and evaluation of changes in participants' attitudes or behaviors of the *Dangerous Choices I* program. First of all, the program should be based on a theory that would guide practitioners in delivering the content of the program to the target groups. Among various theoretical approaches, social learning theory and feminist theory have been recognized in many prevention programs addressing dating violence by practitioners. Still, other theories exist that can be integrated in compliance with the program's goals.

Secondly, the standardization of some program components even at the local level needs to be taken into account. A theory might help to standardize some components of the program, such as teaching the basic concept of the nature of dating violence, its warning signs, and precursors for identifying risk factors on the onset of dating relationships. The idea of standardized curricula is advantageous to help new practitioners carry out the program and replicate it in other settings. In addition, it would be easy for them to follow the content. Finally, if the curriculum is standardized, it is

effective to conduct evaluations of the program because the test items would best reflect the content of the program.

It is evident that the content and the questionnaire items diverge from each other slightly. For example, only one item in the questionnaire did not show a positive change by students after the participation in the program; no student was able to give a correct response. This explains a complicated and confusing construction of the question. The question was asking for information about warning signs, which is very important for participants of the program to understand. The program needs some modification of the questionnaire or has to cover in more detail this part of the content during the presentation of the material.

Additional research is required regarding the aspect of cultural diversity of participants. The study revealed no statistically significant difference between groups, but because the sample was small and not representative, the results may be biased and appropriate only to the present sample.

The agency should administer follow-up evaluations on the same groups from time to time to determine the long-term effectiveness of the program and its impact on the attitudes and behaviors of teenagers.

The agency has to consider extending the length of sessions of presentations in order to include more interactive methods and techniques in delivering the content. A good example would be including multimedia devices or materials to enhance interest of participants to the topic and holding longer discussions than just a didactic approach.

Another important component to incorporate more in depth into the program content is peer involvement. It is necessary to educate peers adequately on how to

respond in unsafe situations and render support for those who seek help from abuse in dating relationships. It is also encouraged by many researches because peers are the key social agents in exhibiting and internalizing healthy behaviors.

Finally, the significance and importance of the problem of teen dating violence has been raised recently by the Pennsylvania Coalition Against Domestic Violence, which stated that teenagers spend a significant part of their lives in school settings. It is the place where the prevention should take place in addressing the dating violence and thus schools need effective polices and procedures. Moreover, the school staff should be also trained to recognize the warning signs of abuse and to provide appropriate referrals for help-seeking students (PCADV, 2009). For that reason, schools should take seriously the problem of teen dating violence and provide all support for practitioners from community agencies in delivering prevention programs on an adequate level. To that extent, Pittsburgh Public Schools District needs to encourage such prevention programs as DCI across city schools and monitor the results of prevention strategies.

VIII. Conclusion

The results on evaluation of the *Dangerous Choices I* prevention program offered at secondary schools showed promising results. The results of the study confirmed that the DCI program produces significant changes in knowledge of participants towards dating violence. In addition to that, test items, in measuring outcomes of the program, are well-covered and reflect components of the program and prove to be effective for increasing knowledge of participants. This knowledge can be applied to further programs for improving prevention strategies towards dating violence.

The study yielded evidence that supports several hypotheses set out for the study. Upon examining the results derived from findings, we may conclude that the *Dangerous Choices I* program is effective for schools in the prevention of teen dating violence and that this kind of program needs to be considered on a regular basis in public schools. The study results proved that there are no statistically significant differences between cultural contexts and settings; the design of the program might not be tailored in terms of race/ethnicity or school location. Other studies should be undertaken in order to explore different factors that might influence knowledge. The same study has to be carried out among male groups to find any gender differences, as well as comparisons with older peers.

In light of some progress that has been made by many researchers in exploring teen dating violence, the results of the present study could contribute to this problem area for further development of strategic actions and policy directions.

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Table 1 *Pretest and Posttest Results on Item One*

Pretest results on item one

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sexual abuse	2	2.8	2.8	2.8
	Physical abuse	3	4.2	4.2	7.0
	Psychological abuse	34	47.9	47.9	54.9
	Physical and psychological abuse	2	2.8	2.8	57.7
	Do not know	30	42.3	42.3	100.0
	Total	71	100.0	100.0	

Posttest results on item one

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than three examples	47	66.2	83.9	83.9
	Three examples	9	12.7	16.1	100.0
	Total	56	78.9	100.0	
Missing		15	21.1		
Total		71	100.0		

Table 2 *Pretest and Posttest Results on Item Two*

Pretest results on item two

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrect	37	52.1	52.1	52.1
	Correct	34	47.9	47.9	100.0
	Total	71	100.0	100.0	

Posttest results on item two

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrect	10	14.1	14.1	14.1
	Correct	61	85.9	85.9	100.0
	Total	71	100.0	100.0	

Table 3 *Pretest and Posttest Results on Item Three*

Pretest results on item three

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrect	17	23.9	23.9	23.9
	Correct	54	76.1	76.1	100.0
	Total	71	100.0	100.0	

Posttest results on item three

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrect	14	19.7	19.7	19.7
	Correct	57	80.3	80.3	100.0
	Total	71	100.0	100.0	

Table 4 *Pretest and Posttest Results on Item Four*

Pretest results on item four

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	13	18.3	18.3	18.3
	At least 2 correct	13	18.3	18.3	36.6
	At least 3 correct	24	33.8	33.8	70.4
	All 4 correct	21	29.6	29.6	100.0
	Total	71	100.0	100.0	

Posttest results on item four

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	3	4.2	4.2	4.2
	At least 2 correct	6	8.5	8.5	12.7
	At least 3 correct	12	16.9	16.9	29.6
	All 4 correct	49	69.0	69.0	98.6
	Did not answer	1	1.4	1.4	100.0
	Total	71	100.0	100.0	

Table 5 *Pretest and Posttest Results on Item Five*

Pretest results on item five

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrect	14	19.7	100.0	100.0
Missing		57	80.3		
Total		71	100.0		

Posttest results on item five

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than three examples	23	32.4	38.3	38.3
	Three examples	37	52.1	61.7	100.0
	Total	60	84.5	100.0	
Missing		11	15.5		
Total		71	100.0		

Table 6 *Pretest and Posttest Results on Item Six*

Pretest results on item six

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	7	9.9	9.9	9.9
	At least 2 correct	5	7.0	7.0	16.9
	At least 3 correct	22	31.0	31.0	47.9
	At least 4 correct	22	31.0	31.0	78.9
	At least 5 correct	12	16.9	16.9	95.8
	At least 6 correct	2	2.8	2.8	98.6
	All 7 correct	1	1.4	1.4	100.0
	Total	71	100.0	100.0	

Posttest results on item six

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	2	2.8	2.9	2.9
	At least 2 correct	4	5.6	5.7	8.6
	At least 3 correct	20	28.2	28.6	37.1
	At least 4 correct	22	31.0	31.4	68.6
	At least 5 correct	18	25.4	25.7	94.3
	At least 6 correct	4	5.6	5.7	100.0
	Total	70	98.6	100.0	
Missing	System	1	1.4		
Total		71	100.0		

Table 7 *Pretest and Posttest Results on Item Seven*

Pretest results on item seven

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	5	7.0	7.0	7.0
	At least 2 correct	14	19.7	19.7	26.8
	At least 3 correct	26	36.6	36.6	63.4
	All 4 correct	25	35.2	35.2	98.6
	Do not know	1	1.4	1.4	100.0
	Total	71	100.0	100.0	

Posttest results on item seven

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	5	7.0	7.0	7.0
	At least 2 correct	9	12.7	12.7	19.7
	At least 3 correct	18	25.4	25.4	45.1
	All 4 correct	39	54.9	54.9	100.0
	Total	71	100.0	100.0	

Table 8 *Pretest and Posttest Results on Item Eight*

Pretest results on item eight

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	19	26.8	26.8	26.8
	At least 2 correct	19	26.8	26.8	53.5
	All 3 correct	31	43.7	43.7	97.2
	Did not answer	2	2.8	2.8	100.0
	Total	71	100.0	100.0	

Posttest results on item eight

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	8	11.3	11.3	11.3
	At least 2 correct	29	40.8	40.8	52.1
	All 3 correct	34	47.9	47.9	100.0
	Total	71	100.0	100.0	

Table 9 *Pretest and Posttest Results on Item Nine*

Pretest results on item nine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	20	28.2	28.2	28.2
	All 2 correct	47	66.2	66.2	94.4
	Did not answer	4	5.6	5.6	100.0
	Total	71	100.0	100.0	

Posttest results on item nine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At least 1 correct	20	28.2	28.2	28.2
	All 2 correct	50	70.4	70.4	98.6
	Did not answer	1	1.4	1.4	100.0
	Total	71	100.0	100.0	

Table 10 *A Paired-Sample T-Test Result for School 1*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total posttest	17.1111	27	3.21455	.61864
	Total pretest	14.1852	27	3.85344	.74159

Paired Samples Correlations School 1

		N	Correlation	Sig.
Pair 1	Total posttest & Total pretest	27	.731	.000

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Total posttest & Total pretest	2.92593	2.65918	.51176	1.87399	3.97786	5.717	26	.000

Table 11 *A Paired-Sample T-Test Result for School 2*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total posttest	16.0227	44	2.70648	.40802
	Total pretest	14.3864	44	2.63444	.39716

Paired Samples Correlations School 2

		N	Correlation	Sig.
Pair 1	Total posttest & Total pretest	44	.289	.057

Paired Samples Test School 2

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Total posttest - Total pretest	1.63636	3.18493	.48015	.66806	2.60467	3.408	43	.001

Table 12 *The Wilcoxon Signed-Rank Test Results for School 1*

		Percentiles		
	N	25th	50th (Median)	75th
Total pretest scores	27	14.0000	15.0000	17.0000
Total posttest scores	27	16.0000	18.0000	19.0000

		N	Mean Rank	Sum of Ranks
Total posttest - Total pretest	Negative Ranks	3[a]	5.83	17.50
	Positive Ranks	22[b]	13.98	307.50
	Ties	2[c]		
	Total	27		

a. Total posttest < Total pretest

b. Total posttest > Total pretest

c. Total posttest = Total pretest

Test Statistics[b]

School 1	Total posttest - Total pretest
Z	-3.918[a]
Asymp. Sig. (2-tailed)	.000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Table 13 *The Wilcoxon Signed-Rank Test results for School 2*

		Percentiles		
	N	25th	50th (Median)	75th
Total pretest scores	44	13.0000	14.0000	16.7500
Total posttest scores	44	15.0000	17.0000	18.0000

		N	Mean Rank	Sum of Ranks
Total posttest - Total pretest	Negative Ranks	13[a]	16.23	211.00
	Positive Ranks	29[b]	23.86	692.00
	Ties	2[c]		
	Total	44		

a. Total posttest < Total pretest

b. Total posttest > Total pretest

c. Total posttest = Total pretest

Test Statistics[b]

School 2	Total posttest - Total pretest
Z	-3.023[a]
Asymp. Sig. (2-tailed)	.003

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Table 14: *An Independent-Sample T-Test Result between Schools Based on Pretest Scores*

	School	N	Mean	Std. Deviation	Std. Error Mean
Total pretest scores	School 1	27	14.1852	3.85344	.74159
	School 2	44	14.3864	2.63444	.39716

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Total pretest scores	Equal variances assumed	2.782	.100	-.261	69	.795	-.20118	.76999	-1.73727	1.33491
	Equal variances not assumed			-.239	41.013	.812	-.20118	.84125	-1.90010	1.49774

Table 15 *An Independent-Sample T-Test Result between Schools Based on Posttest Scores*

	School	N	Mean	Std. Deviation	Std. Error Mean
Total posttest scores	School 1	27	17.1111	3.21455	.61864
	School 2	44	16.0227	2.70648	.40802

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Total posttest scores	Equal variances assumed	.073	.788	1.531	69	.130	1.08838	.71100	-.33002	2.50679
	Equal variances not assumed			1.469	48.043	.148	1.08838	.74108	-.40162	2.57838

Table 16 *An Independent-Sample T-Test Result between Race/Ethnicity Based on Pretest Scores*

	Race	N	Mean	Std. Deviation	Std. Error Mean
Total pretest scores	African-American	50	14.6000	2.86428	.40507
	Caucasian	21	13.6190	3.66710	.80023

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Total pretest scores	Equal variances assumed	.645	.425	1.210	69	.231	.98095	.81088	-.63671	2.59861
	Equal variances not assumed			1.094	30.739	.283	.98095	.89691	-.84893	2.81084

Table 17 *An Independent-Sample T-Test Result between Race/Ethnicity Based on Posttest Scores*

	Race	N	Mean	Std. Deviation	Std. Error Mean
Total posttest scores	African-American	50	16.2200	2.69004	.38043
	Caucasian	21	16.9524	3.47097	.75743

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Total posttest scores	Equal variances assumed	.189	.665	-.959	69	.341	-.73238	.76395	-2.25641	.79165
	Equal variances not assumed			-.864	30.570	.394	-.73238	.84760	-2.46206	.99729

Table 18 *Chi-Square Test Results Based on Pretest Scores Between Race/Ethnicity*

			Race/Ethnicity		
			African-American	Caucasian	Total
Pretest scores	Low scores	Count	26	12	38
		% within pretest	68.4%	31.6%	100.0%
		% within Race/Ethnicity	52.0%	57.1%	53.5%
		% of Total	36.6%	16.9%	53.5%
	High scores	Count	24	9	33
		% within pretest	72.7%	27.3%	100.0%
		% within Race/Ethnicity	48.0%	42.9%	46.5%
		% of Total	33.8%	12.7%	46.5%
Total		Count	50	21	71
		% within pretest	70.4%	29.6%	100.0%
		% within Race/Ethnicity	100.0%	100.0%	100.0%
		% of Total	70.4%	29.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.157[a]	1	.692		
Continuity Correction[b]	.018	1	.892		
Likelihood Ratio	.158	1	.691		
Fisher's Exact Test				.796	.447
Linear-by-Linear Association	.155	1	.694		
N of Valid Cases	71				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.76.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	-.047	.692
	Cramer's V	.047	.692
N of Valid Cases		71	

Table 19 *Chi-Square Test Results Based on Posttest Scores Between Race/Ethnicity*

			Race/Ethnicity		
			African-American	Caucasian	Total
Posttest scores	Low scores	Count	23	9	32
		% within posttest	71.9%	28.1%	100.0%
		% within Race/Ethnicity	46.0%	42.9%	45.1%
		% of Total	32.4%	12.7%	45.1%
	High scores	Count	27	12	39
		% within posttest	69.2%	30.8%	100.0%
		% within Race/Ethnicity	54.0%	57.1%	54.9%
		% of Total	38.0%	16.9%	54.9%
Total		Count	50	21	71
		% within posttest	70.4%	29.6%	100.0%
		% within Race/Ethnicity	100.0%	100.0%	100.0%
		% of Total	70.4%	29.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.059[a]	1	.808		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.059	1	.808		
Fisher's Exact Test				1.000	.509
Linear-by-Linear Association	.058	1	.809		
N of Valid Cases	71				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.46.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.029	.808
	Cramer's V	.029	.808
N of Valid Cases		71	

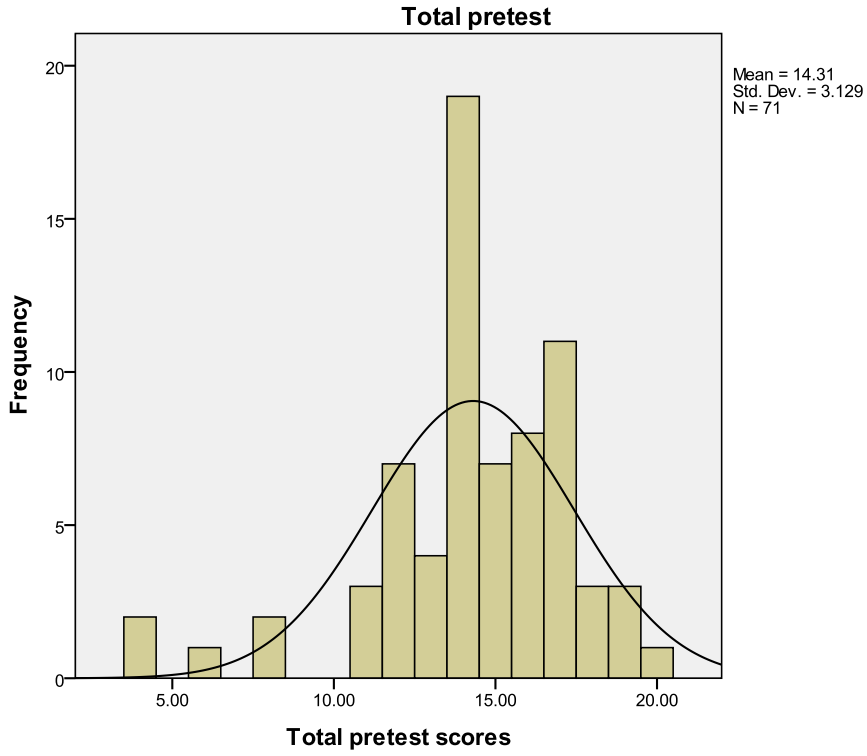

Figure 1. Total pretest results.

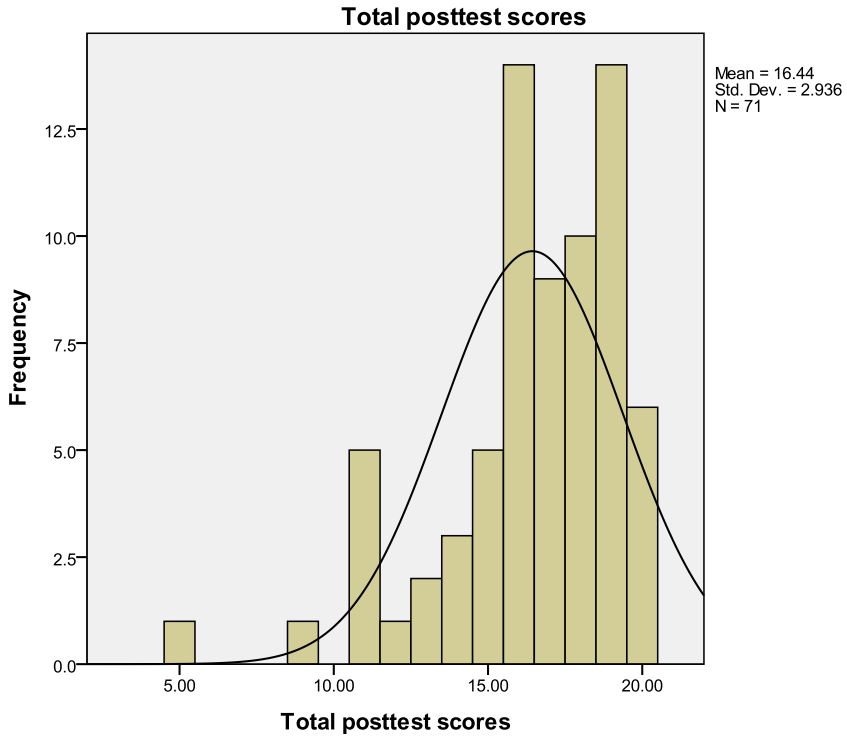

Figure 2. Total posttest results

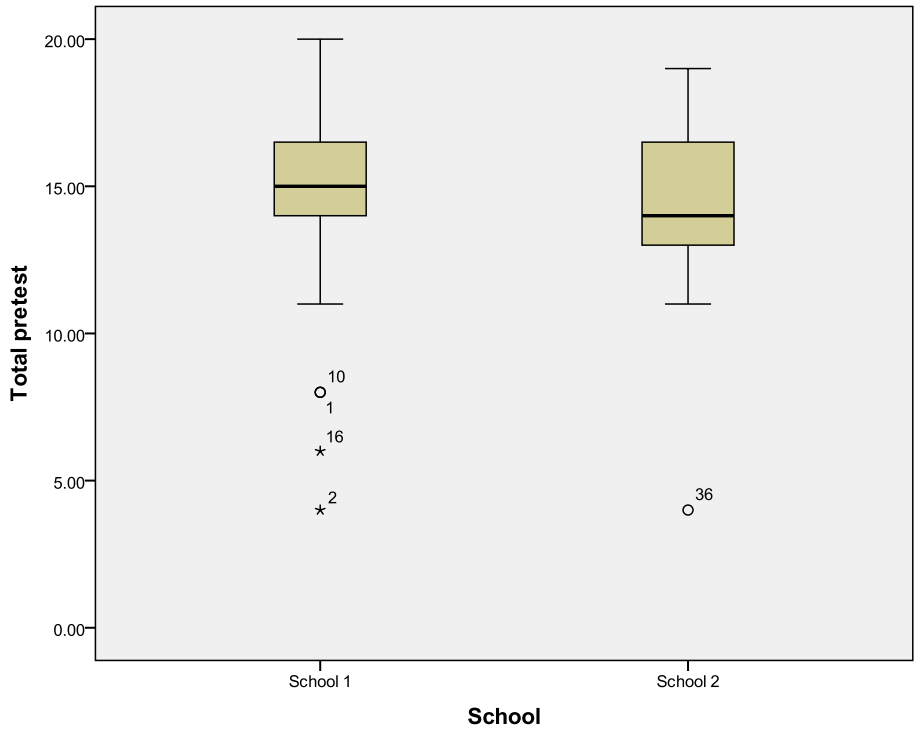

Figure 3. Boxplots displaying total pretest scores between schools.

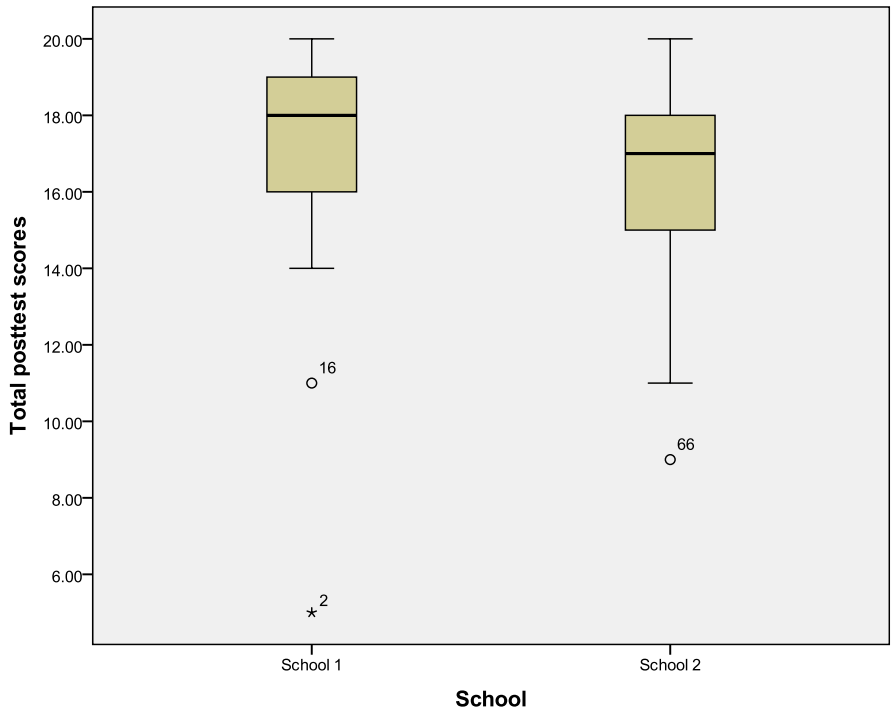

Figure 4. Boxplots displaying total posttest scores between schools.

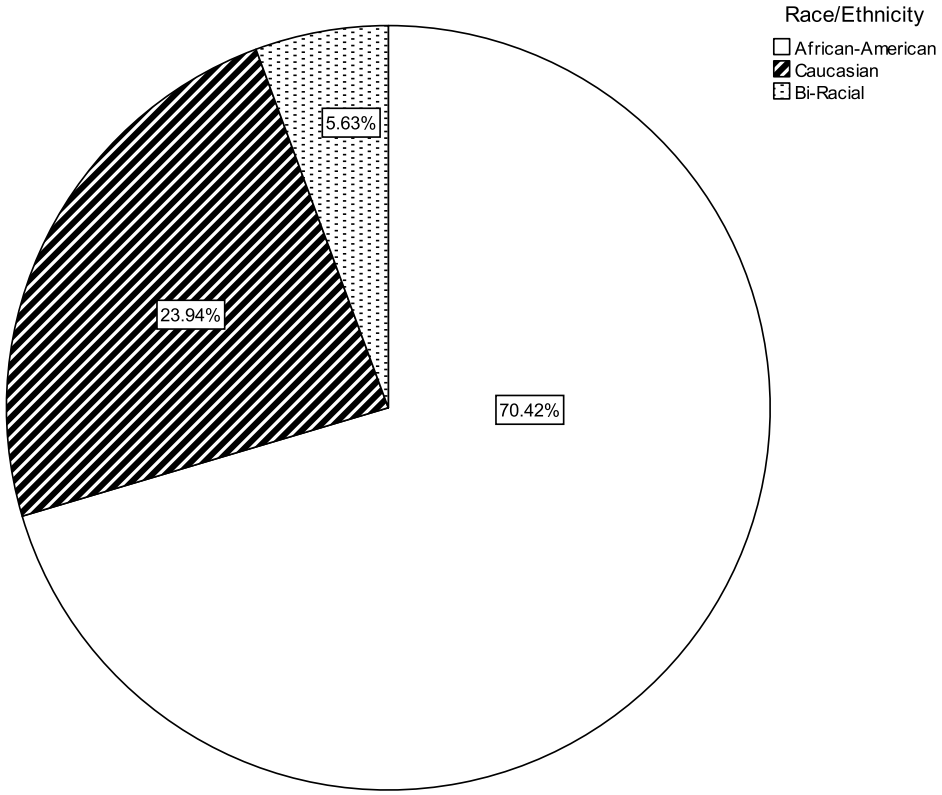

Figure 5. Race/Ethnicity breakdown.

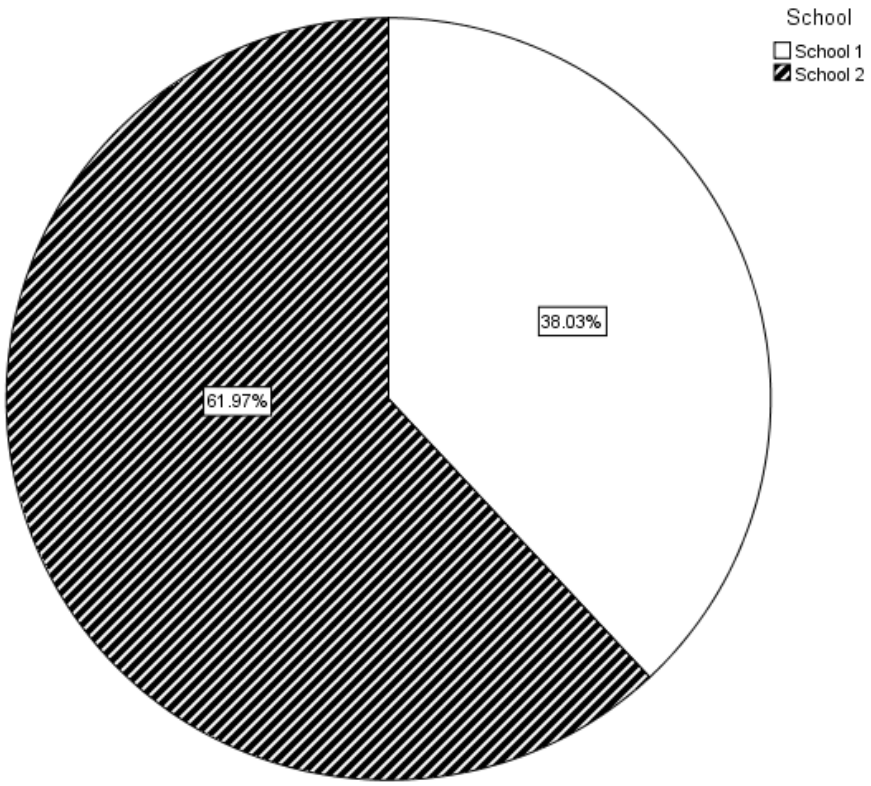

Figure 6. School breakdown.